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# The role of K –ATP channel in the preconditioning effect of magnesium in the rat isolated heart

Bazargan M., Faghihi M, Karimian SM, Chitsaz M., Mirershadi F

## Abstract:

There is growing interest for beneficial effect of Mg in the cardiovascular disorders. A number of cardiovascular disorders including myocardial infarction, arrhythmias and congestive heart failure have been associated with low extracellular or intracellular concentrations of Mg. The aim of present study was to investigate the preconditioning effects of magnesium (Mg) on cardiac function and infarct size in the globally ischemic-reperfusion in isolated rat heart. Rat hearts were Langendorff-perfused, subjected to 30 minutes of global ischemia and 90 minutes of reperfusion, and assigned to one of the following treatment groups with 7 hearts in each group: (1) control, (2) ischemic- reperfusion, (IR), (3) ischemic preconditioning, (IPC) of 5 minutes of global ischemia - reperfusion before lethal ischemia; or pretreatment with (4) 30 µmol/L of Diazoxide (Dia), (5) 8 mmol/L magnesium, (6) 10 µmol/L glibenclamid (Gli), (7) magnesium and Dia and (8) magnesium and Gli. Infarct size was measured by the triphenyltetrazolium chloride method. Left ventricular function was assessed by left ventricular developed pressure (LVDP), heart rate and coronary flow (CF). Mg limited infarct size (9.76 % vs 44.47% in IR, P< 0.001) as did Dia (10.2 % vs 44.4 % in IR P< 0.001) and IPC (8.69 % vs 44.47% in IR, P< 0.001). The protective effect of magnesium was abolished by Gli. Administration of Mg had an anti-infarct effect in ischemic-reperfusion isolated rat hearts and improved cardiac function. Blockade of K-ATP channel abolished the protective effects of magnesium and suggest that K-ATP channel has an important role in this effects.

## Keywords:

K-ATP channel ، infarction ، ischaemia ، Diazoxide ، Glibenclami

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